

When to stop contact tracing: Developing triggers from PHE systems

Version: 1.0

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- Mathematical modelling has been undertaken by modellers from PHE, Universities of Manchester and Cambridge.
- This modelling has examined the role of case identification, contact tracing, and case and contact isolation (CCI) (attached)
- The modelling has used an assumption that this process prevents at least 30% of transmission from such cases.
- The model describes CCI events as those which will involve managing a contact, whether this is a new contact or an existing contact that is currently within their 14 day follow-up period.
- The modelling indicated that the ability to manage imported cases and any first generation cases arising from these, could be described by 800 CCI events at an assumed rate of 5 importations per week.
- The modelling indicated that if the number of CCI events expanded to 8000 per day from 800 contacts per day, then that would potentially extend containment by a range of approximately five to seven days.
- However, by this point it is likely that the transmission chain will likely include at least second or third generations of cases.
- It is considered that at this point, the cumulative inefficiencies in contact tracing per generation of cases will mean that the CCI approach is no longer likely to result in successful containment due to:
 - increased proportions of contacts which are not be identified by the contact tracing process, and
 - contact tracing achieves low case ascertainment
- The triggers are therefore based on detecting second and third generation cases. Additional considerations are:
 - The context of second and higher generation cases; transmission chains in closed settings such as care facilities do not have the same implications as those chains in the community
 - In some scenarios, the detection of a single case may be assumed to represent a second or higher generation transmission event. This applies to confirmed cases which do not fulfil the case definition and cannot be epidemiologically linked to known case. Such cases will only be detected by enhanced surveillance activities.
 - Enhanced surveillance is currently a composite of low and high severity sentinel surveillance systems, which will have sensitivity related to the coverage of the sentinel network, and the severity profile of the infection.
 - Higher sensitivity detection approaches would require universal amendments to the case definition for testing.

- Given these considerations, an absolute number of confirmed cases is unlikely to be a useful marker of second or higher generation cases.

Proposed work: Further rapid modelling work is required to link the sensitivity of the surveillance systems (based on population coverage and distribution of clinical severity described in China) to the current model and determine what the first few cases detected through surveillance represent in terms of community-based transmission.

Projected triggers based on preliminary surveillance systems estimates

1. First case diagnosed through low severity (GP) surveillance, which has no link to an affected country or known case
2. First case diagnosed through high severity (ICU) surveillance, which has no link to an affected country or known case
3. Multiple identified chains of transmission reaching third generation cases or higher in a community context